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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/736,181	12/15/2000	Jean-Pierre Balech	Q62176	8795

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SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC  
2100 Pennsylvania Avenue N.W.  
Washington, DC 20037-3213

EXAMINER
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TRAN, KHANH C

ART UNIT	PAPER NUMBER
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2631

DATE MAILED: 12/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/736,181

Applicant(s)

BALECH, JEAN-PIERRE

Examiner

Khanh Tran

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. The Amendment filed on 03/31/2004 has been entered. Claims 1-6 are pending in this Office action.

### ***Response to Arguments***

2. Applicant's arguments, see page 5 of the Amendment, filed on 03/31/2004, with respect to claims 1-6 under 35 U.S.C 112, 2<sup>nd</sup> paragraph, rejection as well as 35 U.S.C 101 rejection have been fully considered and are persuasive after claims have been amended to more clearly recite the features of Applicant's invention in light of the specification. The rejection of claims 1-6 has been withdrawn.

3. Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

### ***Specification***

4. The abstract of the disclosure is objected to because the title "A Method For Enhancing The Capacity of A Cellular Radio Communication System And Corresponding System" and "Fig. 1" should be deleted from the Abstract. Correction is required. See MPEP § 608.01(b).

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5.

**Content of Specification**

- (a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.
- (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
- (c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.
- (d) Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.  
  
Or alternatively, Reference to a "Microfiche Appendix": See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.
- (e) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:
  - (1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."
  - (2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are

solved by the applicant's invention. This item may also be titled "Background Art."

- (f) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.
- (g) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.
- (h) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.
- (i) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).
- (j) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if

an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).

- (k) Sequence Listing. See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Billstrom U.S. Patent 5,983,101.

Regarding claim 1, Billstrom invention comprises two parts: first part describes situations of possible interference in a point to multipoint system as illustrates in figures 1 and 1A, second part showing steps of network planning processor according to Billstrom teachings.

Regarding to the claimed preamble: In column 3, line 4 through column 4 line 15, figure 1 shows a microwave coverage network 20. Network 20 includes a regular pattern of base station sites and the corresponding cell or coverage area for each base station site is shown as a square, with a base station site being located at the center of the square. As illustrates in figure 1, terminal T1 is located in sector S4<sub>C1</sub>, which is

served by base station B1-4 (see figure 1A). Figure 1 only shows one terminal T1 is located in sector S4<sub>C1</sub>. However, the base station B1-4 is connected by a plurality of subscriber terminals located within respective coverage areas of the base station B1-4, wherein at least some of the plurality of radio links being within a same frequency band, in another word, the same channel as appreciated by one of ordinary skill in the art. In the method of allocating radio link characteristics in a point to multipoint radio access system shown in figure 4A, each of the plurality of modulation types is determined for maximum range. Then, each of the plurality of subscriber terminals corresponding to a respective radio link is allocated a modulation type dependent upon range from the base station B1-4. In view of that, it would have been obvious for one of ordinary skill in the art at the time the invention was made that several subscriber terminals can be assigned the same modulation type (e.g. QPSK  $\frac{1}{2}$ , QPSK  $\frac{3}{4}$ , QPSK  $\frac{7}{8}$ , 8 TCM  $\frac{2}{3}$ , 16 TCM  $\frac{3}{4}$  as shown in Table I in column 5) when subscriber terminals have the same range from the base station B1-4. The motivation is explained in Billstrom invention in that the *minimum bandwidth modulation type* is allocated to each terminal in dependence on its range from the base station. Hence, when several terminals have the same range from the base station, the same modulation type is assigned to several terminals as appreciated by one of ordinary skill in the art. Furthermore, Billstrom expresses that each terminal is allocated an individual frequency from a range of frequencies available in the frequency band. Therefore, interference from each other terminal is less likely. Referring back to figure 1, terminal T1 in sector S4<sub>C1</sub> may experience interference from a terminal T2, corresponding to the claimed distant end-

user, located in S4<sub>C2</sub>. Terminal T2 communicating with B2-4, which corresponds to the claimed distant base station, would cause interference to base station B1-4.

Regarding to the claimed step of determining the size and location of at least one domain in the cell as set forth in the application claim: Billstrom does not teach the claimed step. However, Billstrom expresses that inputs to Network planning processor 110 includes the *locations of the base stations B and the terminals T*, the *particular antenna patterns employed*, basic link parameters and modulations sensitivities such as carrier-to-noise ratio (C/N) and carrier-to-interference ratio (C/I), see column 4, lines 55-67. The antenna patterns as taught by Billstrom would correspond to the claimed antenna directivity. Further shown in step 408, for each terminal, a calculation is performed of the C/I ratio, wherein *the interference from all other base stations* is calculated taking the polarizations, *antenna patterns* and the interferences are added together to obtain "I" of the C/I ratio, see column 6, lines 45-55. In view of the foregoing disclosure, it would have been obvious for one of ordinary skill in the art at the time the invention was made that the network planning processor 110 would be able to determine the size and location of a domain having the same interference level based on inputted information. A person of average skill in the art will recognize that with all the parameters in addition to measure the interference level for each subscriber, the network planning processor 110 can determine the size and location of an area where the same interference level is measured. Those information are used to allocate which modulation types as part of the network planning.



Regarding to the claimed step of assigning a second modulation type to at least one domain in the cell as set forth in the application claim: in column 6 line 54 through column 7 line 12, at step 410 of the method in figure 4B, the calculated C/I ratio as recited above is checked to determine if it is greater than the minimum required C/I, which corresponds to the claimed predetermined interference level. If the required C/I is not satisfied, meaning calculated C/I being lower the minimum required C/I, the next lower modulation type (more robust modulation type) is selected for that terminal at step 412. Hence, all terminals having the same C/I are assigned the same next lower modulation type, which corresponds to the claimed a second modulation type.

Regarding to the claimed step of wherein end-users located in the domain communicate with the base station using the second modulation type over a second communication, said second modulation type having high efficiency than the first modulation type: as recited above, the next lower modulation type (more robust modulation type) is selected. Because the lower modulation type is robust due to lower interference level, the modulation type has higher efficiency than the first modulation type. Billstrom does not expressly teach using a second modulation type over a second communication channel. However, expressed in column 9, lines 25-40, the invention also applies to a system with dynamic channel allocation, and the links can operate in *more than* one frequency band. In view of that it would have been obvious for one of ordinary skill in the art at the time the invention was made that the second modulation type is over a second communication channel. The motivation is obvious that terminals

using the same frequency over the same channel cause interference. Moving the users to different channel would alleviate that.

Regarding claim 2, Billstrom discloses that terminals are located at premises of customers. Hence, the terminals are fixed terminals. Furthermore, as recited in claim 1, due to interference level check, terminals may be switched to the lower modulation type, which are more robust than the first modulation type. That step corresponds to the claimed step of *"configuring end-users to use only the second modulation type if end-users are located in the at least one domain in which the interference level is lower than the predefined interference level"*. Referring the example in figure 1, potential interference occurs only when terminals T1 and T2, which T2 is representative of one of distant end-users, were assigned the same frequency in the same channel, and terminal T2 is more or less in line with base station 1-4 and base station 2-4. Because T1 is switched to different modulation type on different channel, interference is alleviated, and hence there is no need to configure T2 to use different modulation type. In view of that, the foregoing discussion addresses the claimed limitation *"configuring the end-users to use only the first modulation type if the end-users are not located in said at least one domain"*.

Regarding claim 3, claim 3 only differs from claim 2 in that the end-users are mobile terminals. Billstrom does not teach the end-users are mobile terminals. However, one of ordinary skill in the art will recognize that Billstrom teachings would apply as well

to the case in which terminals are mobile users for the following reasons: Billstrom invention applies to a system with dynamic channel allocation (see column 9, lines 25-30), dynamic bandwidth allocation mode (see column 5, lines 5-15). In column 8, lines 23-45, a new terminal can be added to the system and the network planning processor 210 executes the same method to determine the modulation type, bandwidth, and frequency use for the new terminal. Furthermore, in dynamic bandwidth allocation mode, modulation type is done momentarily by the control unit 70 in the sector. In light of the foregoing disclosure, all functionalities of the network planning processor would not only perform on fixed terminals, but also on mobile terminals. The other limitations of claim 3 are rejected on the same ground as for those of claim 2 because of similar scope.

Regarding claim 4, Billstrom does not teach the first modulation type is 4QAM and the second modulation type is 16QAM. However, Billstrom invention gives five different examples of modulation types and correspondent characteristics shown in Table I in column 5. A person of average skill in the art will recognize that Billstrom invention is not limited to the five different examples of modulation types. According to Billstrom teachings, the allocation of a modulation type for each terminal is part of the network planning, and can be adaptively change to make optimum usage of the total bandwidth. In view of that, utilization of 4QAM for a first modulation type and 16QAM for a second modulation type can be implemented as part of the network planning by the network planning processor 110 as taught in Billstrom invention.

Regarding claim 5, Billstrom expresses that the radio links between subscriber terminals and base stations all work within the same frequency band, see column 8, lines 45-65. In view of that, the channels in figure 1 are channels of frequency.

Regarding claim 6, claim 6 is rejected on the same ground as for claim 1 because of similar scope. Every limitation of claim 6 has been discussed in claim 1 above.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Schafer U.S. Patent 6,404,755 B1 discloses "Multi-level Information Mapping System and Method".

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Tran whose telephone number is 571-272-3007. The examiner can normally be reached on Monday - Friday from 08:00 AM - 05:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KCT

Phanh Cong Tran 12/23/2004  
/ Examiner KHANH TRAN